WHAT IS CLAIMED IS:

1. A rocket comprising:

1) an air-breathing external combustion rocket engine comprising:

a fuel tank configured to contain a fuel combustible with air;

a working medium tank configured to contain a working medium;

a combustor connected to the fuel tank and configured to combust said fuel with air to form a hot product gas;

a heat exchanger connected to the combustor and configured to heat said working medium with said hot product gas via heat conducting walls of the heat exchanger so as to generate a high-energy working medium having a high pressure; and

a nozzle connected to at least one of the working medium tank and the heat exchanger and configured to expand said high-energy working medium so as to generate thrust; and

2) accommodations for a human passenger sufficient to allow said human passenger to fly on said rocket.

2. The rocket as claimed in claim 1, further comprising a second stage connected to said accommodations and detachable from a first stage, said first stage comprising said working medium tank, said heat exchanger, and said nozzle, wherein said second stage comprises: said fuel tank; said combustor; a second working medium tank configured to contain a second working medium; a second heat exchanger connected to the combustor and configured to heat said second working medium via heat conducting walls of the second heat exchanger so as to generate a high-energy second working medium having a second high pressure, and a second nozzle configured to expand said high-energy second working medium so as to generate thrust to accelerate said second stage and said accommodations after detachment from said first stage.

3. The rocket as claimed in claim 2, wherein said heat exchanger comprises a first portion and a second portion, wherein said high-energy working medium comprises a liquid phase and a gas phase, wherein said first portion is configured to heat said liquid

phase so as to generate a saturated gas, and wherein said second portion is configured to heat said gas phase so as to generate a superheated, nonsaturated gas, and

wherein said second heat exchanger comprises a third portion and a fourth portion, wherein said high-energy second working medium comprises a second liquid phase and a second gas phase, wherein said third portion is configured to heat said second liquid phase so as to generate a second saturated gas, and wherein said fourth portion is configured to heat said second gas phase so as to generate a second superheated, nonsaturated gas.

4. The rocket as claimed in claim 1, further comprising a second stage connected to said accommodations and detachable from a first stage, said first stage comprising said fuel tank, said working medium tank, said combustor, said heat exchanger, and said nozzle, wherein said second stage comprises: a second working medium tank configured to contain a second working medium; a second heat exchanger configured to heat said second working medium via heat conducting walls of the second heat exchanger so as to generate a high-energy second working medium having a second high pressure; and a second nozzle configured to expand said high-energy second working medium so as to generate thrust to accelerate said second stage and said accommodations after detachment from said first stage.

5. The rocket as claimed in claim 1, further comprising a binary valve configured to start a flow of said high-energy working medium from said nozzle, wherein said binary valve is configured such that: a) while a pressure inside said working medium tank is less than a threshold operating pressure, the valve remains closed; and b) when said pressure rises above the threshold operating pressure, the valve opens approximately fully.

6. The rocket as claimed in claim 1, further comprising a continuous valve configured to be capable of substantially continuously adjusting a flow rate of said high-energy working medium from said nozzle, wherein said continuous valve is configured to adjust said flow rate so that said thrust causes a substantially constant acceleration on said rocket throughout a flight of at least one of said rocket and a stage of said rocket.

7. The rocket as claimed in claim 1, wherein said heat exchanger comprises a first portion and a second portion, wherein said high-energy working medium comprises a liquid phase and a gas phase, wherein said first portion is configured to heat said liquid phase so as to generate a saturated gas, and wherein said second portion is configured to heat said gas phase so as to generate a superheated, nonsaturated gas.

8. The rocket as claimed in claim 1, further comprising a rocket parachute connected to said rocket and a parachute controller connected to said rocket parachute and configured to open said rocket parachute after said rocket reaches a flight apogee, wherein said rocket parachute is configured to land said rocket without causing substantial damage to the rocket.

9. The rocket as claimed in claim 8, further comprising: a valve, comprising at least one of a binary valve and a continuous valve, configured to regulate a flow of said high-energy working medium from said nozzle; and a valve controller connected to said valve and configured to open said valve so as to generate a landing thrust after said rocket parachute has been deployed and before said rocket has landed, wherein a landing impact speed of the rocket is reduced by said landing thrust.

10. The rocket as claimed in claim 8, further comprising a deformable material configured and positioned on the rocket so as to absorb an energy of impact due to the landing of the rocket.

11. The rocket as claimed in claim 8, wherein said rocket parachute comprises a steering mechanism, wherein said rocket further comprises a steering controller connected to said steering mechanism and configured to perform at least one of the following functions: control said steering mechanism so as to land said rocket at a predetermined landing region; and control said steering mechanism so as to reduce a vertical speed of said rocket when landing.

12. The rocket as claimed in claim 8, wherein said rocket parachute is a quick-open parachute that does not require air pressure from a high vertical speed to open the quick-open parachute.

13. The rocket as claimed in claim 1, further comprising a shock absorber between said rocket engine and said accommodations and configured to absorb a shock created by an unexpected breach in the working medium tank.

14. The rocket as claimed in claim 1, wherein a minimum distance between said accommodations and said working medium tank is at least 10 feet.

15. The rocket as claimed in claim 1, wherein said working medium tank is configured to burst in a predictable manner.

16. The rocket as claimed in claim 1, wherein said working medium tank is configured to contain a pressure at least approximately three times greater than said high pressure of said high-energy working medium.

17. The rocket as claimed in claim 1, wherein said working medium tank is constructed substantially of at least one of paper and plastic.

18. The rocket as claimed in claim 1, wherein said rocket is sized and configured to launch said human passenger to an altitude of at least approximately one mile and at most approximately five miles.

19. The rocket as claimed in claim 1, wherein said accommodations are sufficient to allow between two and four passengers to fly on said rocket.

20. The rocket as claimed in claim 1, wherein said accommodations comprise an ejector configured to eject said human passenger approximately when said accommodations have reached an apogee of a flight on said rocket.

21. A rocket system comprising:

1) a heat source;

2) a rocket engine comprising:

a working medium tank configured to contain a working medium at a pressure substantially greater than atmospheric pressure;

a heat exchanger connectable to the heat source and configured to heat said working medium via heat conducting walls of the heat exchanger so as to generate a high-energy working medium having a high pressure; and

a nozzle connected to at least one of the working medium tank and the heat exchanger and configured to expand said high-energy working medium so as to generate thrust; and

3) accommodations for a human passenger sufficient to allow said human passenger to fly on said rocket,

wherein at least one of the following is true:

i) said working medium tank is configured to contain a pressure at least approximately three times greater than said high pressure of said high-energy working medium;

ii) said rocket further comprises a shock absorber located between said rocket engine and said accommodations and configured to absorb a shock created by an unexpected breach in the working medium tank;

iii) a minimum distance between said accommodations and said working medium tank is at least 10 feet;

iv) wherein said working medium tank comprises walls having a first thickness, wherein said working medium tank is configured to burst in a predictable manner in a burst region, wherein said burst region comprises curves having a wall thickness thinner than said first thickness; and

v) wherein said working medium tank is constructed substantially of at least one of paper and plastic.

22. The rocket system as claimed in claim 21, wherein at least two of i) – v) are true.

23. A method of entertaining, comprising performing or inciting a person to perform at least one of steps a) – k):

a) providing on a launchpad the rocket as claimed in claim 1, wherein said rocket engine is a pressure-fed engine, whereby said working medium tank is configured to contain said working medium at said high pressure;

b) opening a fill valve connected to said working medium tank;

c) adding said working medium at a low pressure to said working medium tank via said fill valve;

d) closing said fill valve;

e) adding said fuel at a low pressure to said fuel tank;

f) causing said fuel to flow to said combustor;

g) igniting and combusting said fuel with air in said combustor to form said hot product gas;

h) while said rocket is on the launchpad, heating said working medium with said hot product gas via said heat conducting walls of said heat exchanger to a vapor pressure substantially greater than atmospheric pressure;

i) while said rocket is on the launchpad, replenishing to said fuel tank at least some fuel that has been combusted in said combustor while said rocket has remained on the launchpad;

j) launching said rocket by causing said high-energy working medium to flow through and expand from said nozzle; and

k) while said rocket is in flight, combusting said fuel with air in said combustor to form said hot product gas and heating said working medium with said hot product gas via said heat conducting walls of said heat exchanger to maintain said vapor pressure substantially greater than atmospheric pressure,

wherein steps a) – k) are performed.

24. The method as claimed in claim 23, further comprising inciting a trained professional to fly in said rocket with said human passenger, wherein said trained professional is trained to assist human passengers in safely executing a flight plan.

25. The method as claimed in claim 23, wherein the rocket provided in step a) comprises a second stage connected to said accommodations and detachable from a first stage, said first stage comprising said fuel tank, said working medium tank, said combustor, said heat exchanger, and said nozzle, wherein said second stage comprises: a second working medium tank configured to contain a second working medium; a second heat exchanger configured to heat said second working medium via heat conducting walls of the second heat exchanger so as to generate a high-energy second working medium having a second high pressure; and a second nozzle configured to expand said high-energy second working medium so as to generate thrust to accelerate said second stage and said accommodations after detachment from said first stage,

and wherein the method further comprises, while said rocket remains on the launchpad:

identifying an emergency situation;

detaching said second stage from said first stage; and

causing said high-energy second working medium to flow through and expand from said second nozzle.